TelVue Princeton™ E100W Series Internet Streaming Media Encoder

Version 1.0

User Manual

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All specifications, notices and warnings are subject to change without notice.

Class A Statement

This computer-based video server has been tested by the original manufacturer and found to comply with the limits for a Class A digital device, pursuant to Part 15 (EN61000-3-2) of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance it this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause interference in which case the user will be required to correct the interference at the user's expense.

This device complies with Part 15 (EN61000-3-2) of the FCC rules.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference.

2. This device must accept any interference that may cause undesired operation.

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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Setup

The TelVue Princeton™ E100W Series Internet Streaming Media Encoder offers real-time encoding using your choice of Microsoft's Windows Media Encoder (WME) or Adobe's Flash Media Encoder (FME) for live output at 256 kbps to your broadcast server or website. It is compatible with leading content delivery networks including TelVue's PEG.TV.

Equipment Included with the E100W

- 1-unit PC running Windows XP and including a ViewCast Osprey 210 capture card
- 125v power cord
- BNC connector
- A/V cable
- Hardware manual including safety precautions
- Accessories as specified on the packing checklist

Additional Equipment Needed for E100W Setup

- Standard 19" equipment rack
- Ethernet connection to an IP Network
- AC Power sufficient to run the E100W
- Monitor, keyboard, and mouse for initial setup
- UPS optional but highly recommended for availability and protection

Connecting and Powering-up the E100W

The E100W is pre-configured to open and run FME or WME upon startup, depending on which encoder you ordered.

1. Install the E100W in the equipment rack. Refer to the included hardware manual for instructions.
2. Connect AC power to the E100W.
3. Connect the E100W to the monitor using the A/V cable and BNC connector.
4. Connect the keyboard and mouse to the ports on the back of the E100W.
5. Power on the E100W.
6. When the FME or WME encoding screen is displayed, the E100W has successfully started.

Adding the E100W to Your Network

> *TelVue highly recommends that customers place the E100W behind a firewall device to avoid Denial of Service (DoS)-type attacks or brute force login attempts on the various services.*

Consult your IT department for standard networking security practices including establishing a firewall and remote access. You will need to know the following information when adding the E100W to your network.

1. Know whether your network is protected by a firewall.
2. If you will use WME, make sure port 16000 is open on your network. If you will use FME, make sure port 8888 is open.
3. You should have an external IP address, especially if you plan to use WME. If you will use WME and have an external IP address, TelVue will set up the PULL method of webcasting. This is the preferred configuration.
4. If you will have only a local IP address and will use WME, TelVue will set up the PUSH method of webcasting through a publishing IP address.
5. If you plan to use FME you must use the PUSH method. TelVue will preload the settings.

Typically you install the E100W on your network by plugging one end of an Ethernet cable into the left 10/100/1000 BT connector on the back of the E100W and plugging the other end into a router or switch on your network. Follow your operating system instructions for adding the E100W as a device on your network.

Encoder Profiles

Edit the profile for your Flash Media Encoder or Windows Media Encoder. The encoding parameters in the FME or WME profile are loaded onto the E100W at startup.

TelVue recommends using these general encoding parameters. Sample encoder profiles for FME and WME are attached as an appendix to this manual.

General Encoding Parameters

These parameters provide a general idea of how your streams will look. For specific parameters, refer to your preconfigured Flash Media Profile or Windows Media Profile. You can edit your profile, but remember that high-quality streams require more bandwidth to stream, which in turn costs more than lower-quality streams.

- Frame Rate: 15.00
- Bit Rate: 256 kbps
- Width: 320
- Height: 240
- Quality: Sharpest (80)

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Profiles

TelVue recommends using the preconfigured Flash Media Profile or Windows Media Profile. If you wan to modify your stream settings or maintenance schedule, refer to the FME or WME help screens for instructions on how to edit the profile. Sample profiles with suggestions for other settings are included in the appendix to this manual.

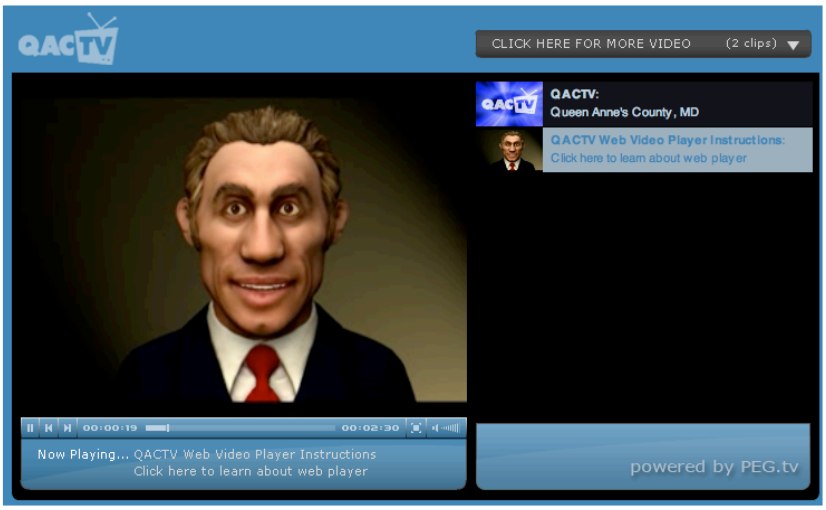
What Your Viewers See

Once your E100W has encoded files, it is ready to play them for your viewers.

PEG.TV Customers

When someone selects a file to view from your webpage, the E100W streams it to the video player on your PEG.TV channel at 256 kbps.

1. The viewer clicks on the name of the file to play.


QACTV
CLICK HERE FOR MORE VIDEO (2 clips)
QACTV:
Queen Anne's County, MD
QACTV Web Video Player Instructions:
Click here to learn about web player
00:00:19
00:02:30
Now Playing... QACTV Web Video Player Instructions
Click here to learn about web player
powered by PEG.tv

A white bar below the video shows how much of the file has played. The counter at the left shows how much of the file has played so far in hours, minutes, and seconds (HH:MM:SS). The counter at the right shows how long the file is.

2. While the file is playing viewers can:
   - Pause.
   - Start from the beginning.
   - Go to the end.
   - Click on the white slider to move forward or backward in the file.
   - Enlarge the video to full screen size. Click on the icon again to return to the player.
   - Adjust the volume.

Other Customers

When someone selects a file to view from your webpage, the E100W streams it to the player of your choice, such as an IPTV service.

Encoding Files Manually

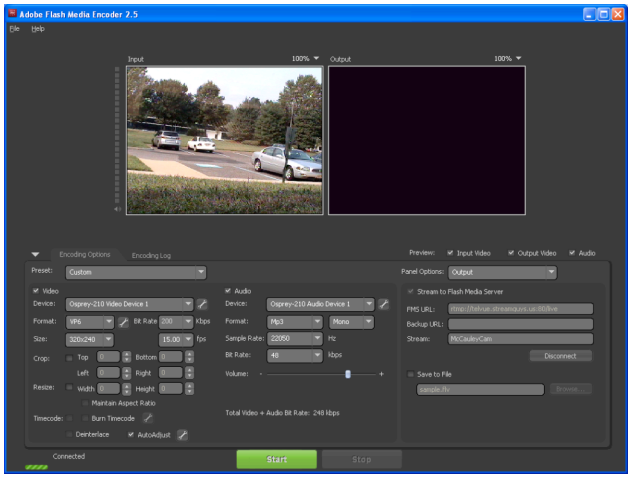
Generally the E100W encodes files for your viewers in real-time. However, you can encode files at any time.

Encoding with Flash Media Encoder

FME works only with live video sources such as the Osprey card on your E100W or a webcam. FME does not transcode existing digital video files.

Note: This example uses FME 2.5.

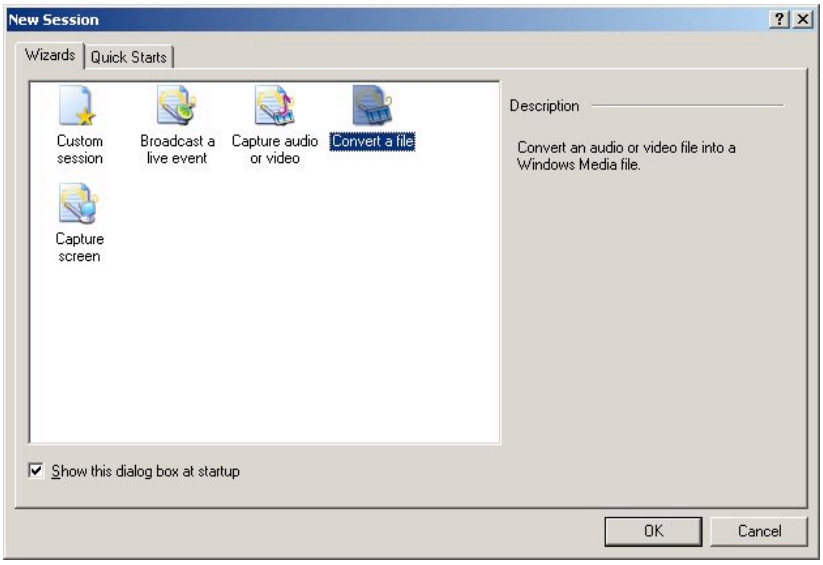
1. If your installation is using Flash Media Encoder, double-click on the Flash desktop icon to open FME. The Flash Media Encoder window is displayed.



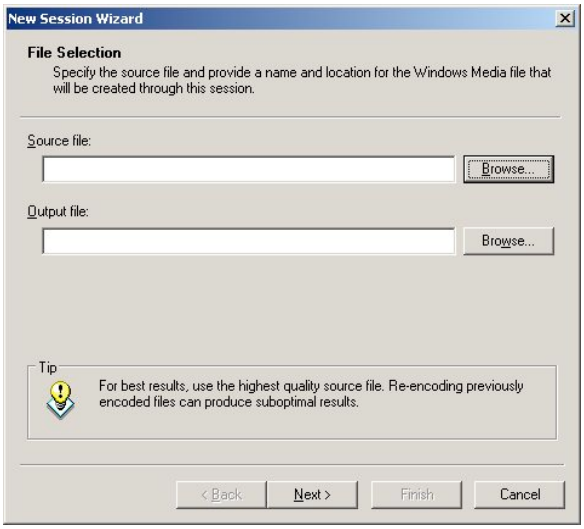
2. Select the Custom preset from the drop-down list. This will set the frame rate, size, video and audio formats, sampling rate, etc.
    - In the Video area, make sure the Device is your Osprey card.
    - In the Audio area, make sure the Device is your Osprey card.
    - Adjust the video and audio settings only if necessary, for example, if a previous attempt made the file too large or it needs cropping.
3. In the Output area, select **Save to File** and enter a location to store the output file. The default folder is C:\Documents and Settings\enc2\My Documents\My Videos. To store your encoded files elsewhere, select another location. Enter a file name.
4. Select **Save to File** and enter a file name.
5. Click the **Start** button at the bottom of the window to begin encoding. When FME has finished encoding you can encode another file or close the window.

Encoding with Windows Media Encoder

1. If your installation is using Windows Media Encoder, double-click on the WME desktop icon to open WME. The New Session window is displayed.



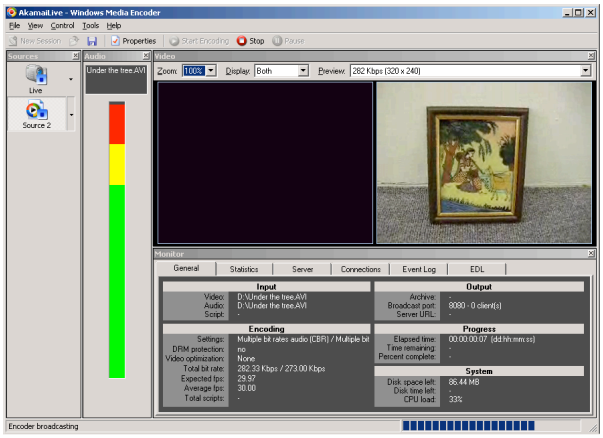
2. Select **Convert a File**. The file location chooser opens.


New Session Wizard
File Selection
Specify the source file and provide a name and location for the Windows Media file that will be created through this session.
Source file:
Browse...
Output file:
Browse...
Tip
For best results, use the highest quality source file. Re-encoding previously encoded files can produce suboptimal results.
< Back
Next >
Finish
Cancel

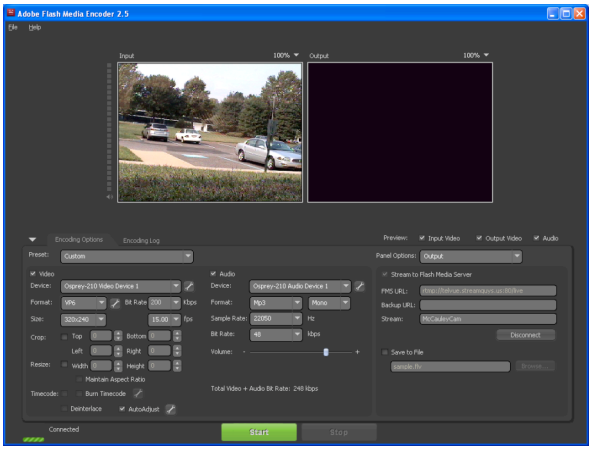
3. Browse for your source file – the file you want to encode.
4. Browse for a location to store the output file. The default is C:\Documents and Settings\enc2\My Documents\My Videos. To store your encoded files elsewhere, select another location. For example, if your player looks in a folder called C:\Website\Content_for_Viewing, select that one. Future WME encoding sessions will default to the last location where you stored files.
5. Click the **Next>** button to begin encoding. When WME has finished encoding it gives you the choice of encoding another file or closing the wizard.

Monitoring the E100W

Under ordinary operating conditions the E100W will display an encoding screen like the examples shown here. You can monitor audio and video quality from these screens. For specific descriptions of the parameters and how to adjust them, refer to the current Windows Media Encoder or Flash Media Encoder documentation.



WME



FME

Maintenance

TelVue has set your profile to restart FME or WME from time to time under certain conditions. Some installations prefer to restart software after a certain number of days. To set a different interval or delete the automatic restart, edit your FME or WME profile.

Flash Media Encoder Automated Maintenance Restarts

Flash Media Encoder is certified to run continuously for 7 days. TelVue recommends you schedule an automated maintenance restart at least that often, at a time when viewers are not likely to be trying to view content on your website. To schedule an automated maintenance restart open the XML profile in an XML or text editor, and add the following lines.

<restartinterval>

<days>dd</days>

<hours>hh</hours>

<minutes>mm</minutes>

</restartinterval>

Once Flash Media Encoder has run continuously for the amount of time you specify, it automatically stops, restarts, and continues encoding to the same session.

Windows Media Encoder Maintenance Restarts

TelVue recommends you restart Windows Media Encoder every 7 days, at a time when viewers are not likely to be trying to view content on your website.

Technical Support

TelVue offers technical support by telephone, email, and Internet portal.

- Toll-free: 800.885.8886
- Email: support@telvue.com
- Support portal: http://www.telvue.com/support.php

You will need a User ID and password to login to the support portal.

The support portal offers a self-service database of solutions, documents, and frequently asked questions.

Glossary

Encoder – a device that creates media files. An ordinary personal computer can use software to act as an encoder, but most uses require dedicated hardware.

Port – 1) a hardware connector where a cable is plugged into a device. 2) a logical channel used to pass information through a firewall or router. *Forwarding a port* means to open that logical channel.

Profile – encoder settings written as an XML file so they can be understood by your encoding software. Your E100W comes with sample profiles for Frame Media Encoder (FME) Windows Media Encoder (WME).

Pull – a connection initiated by a viewer asking to tune into a webcast from a streaming server. The server receives a broadcast from the encoder and redistributes it as a webcast. Data is transferred only because a viewer requests it. The PULL method requires a static IP address.

Push – a connection initiated by an encoder asking to broadcast to a streaming server, which then redistributes the stream to viewers as a webcast. The encoder needs a User ID and password before it permits the streaming server to connect to it. The PUSH method does not require a static IP address.

Webcast – a stream delivered from a server to a viewer's computer via the Internet.

Appendix

Sample Frame Media Profile

This sample profile includes many parameters used when encoding FME files.

```
<?xml version="1.0" encoding="UTF-16"?>
<flashmediaencoder_profile>
    <preset>
        <name>Custom</name>
        <description></description>
    </preset>
    <capture>
        <video>
        <device>Osprey-210 Video Device 1</device>
        <crossbar_input>0</crossbar_input>
        <frame_rate>15.00</frame_rate>
        <size>
            <width>320</width>
            <height>240</height>
        </size>
        </video>
        <audio>
        <device>Osprey-210 Audio Device 1</device>
        <crossbar_input>0</crossbar_input>
        <sample_rate>22050</sample_rate>
        <channels>1</channels>
        <input_volume>75</input_volume>
        </audio>
    </capture>
    <encode>
        <video>
        <format>VP6</format>
        <datarate>200</datarate>
        <advanced>
            <keyframe_frequency>5 seconds</keyframe_frequency>
            <quality>Good Quality - Good Framerate</quality>
            <noise_reduction>None</noise_reduction>
            <datarate_window>Medium</datarate_window>
            <cpu_usage>Dedicated</cpu_usage>
        </advanced>
        <autoadjust>
            <maxbuffersize>1</maxbuffersize>
            <dropframe></dropframe>
        </autoadjust>
        </video>
        <audio>
        <format>Mp3</format>
        <datarate>48</datarate>
        </audio>
```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```
</encode>
<restartinterval>
    <days></days>
    <hours></hours>
    <minutes></minutes>
</restartinterval>
<reconnectinterval>
    <attempts></attempts>
    <interval></interval>
</reconnectinterval>
<output>
    <rtmp>
    <url>rtmp://telvue.streamguys.us:80/live</url>
    <backup_url></backup_url>
    <stream>StreamName</stream>
    </rtmp>
</output>
<metadata>
    <entry>
    <key>author</key>
    <value></value>
    </entry>
    <entry>
    <key>copyright</key>
    <value></value>
    </entry>
    <entry>
    <key>description</key>
    <value></value>
    </entry>
    <entry>
    <key>keywords</key>
    <value></value>
    </entry>
    <entry>
    <key>rating</key>
    <value></value>
    </entry>
    <entry>
    <key>title</key>
    <value></value>
    </entry>
</metadata>
<preview>
    <video>
    <input>
        <zoom>100%</zoom>
    </input>
    <output>
        <zoom>100%</zoom>
```

```
        </output>
        </video>
        <audio></audio>
    </preview>
    <restartinterval>
         <days>dd</days>
        <hours>hh</hours>
        <minutes>mm</minutes>
    </restartinterval>
    <log>
        <level>100</level>
        <directory>C:\Documents and Settings\enc2\My Documents\My Videos</directory>
    </log>
</flashmediaencoder_profile>
```

Sample Windows Media Profile

This sample profile includes many parameters used when encoding FME files.

```
<?xml version="1.0"?>

<WMEncoder major_version="9"
    minor_version="0"
    Name="WMEncoder4277"
    SynchroniesOperation="0" >
    <Description />
    <SourceGroups >
        <SourceGroup Name="Live" >
            <Source Type="WMENC_VIDEO"
                Scheme="device"
                InputSource="o100vc.dll - Osprey Capture Card 1" >
                <UserData >
                    <WMENC_STRING Name="VideoSource" Value="Composite" />
                    <WMENC_LONG Name="VideoSourceIndex" Value="1" />
                    <WMENC_STRING Name="VideoFormat" />
                    <WMENC_LONG Name="Brightness" Value="0" />
                    <WMENC_LONG Name="Contrast" Value="216" />
                    <WMENC_LONG Name="Hue" Value="0" />
                    <WMENC_LONG Name="Saturation" Value="255" />
                    <WMENC_BOOL Name="AnalogBypass" Value="no" />
                    <WMENC_BOOL Name="Filtering" Value="yes" />
                    <WMENC_BOOL Name="Progressive Send" Value="no" />
                    <WMENC_LONG Name="LogoTop" Value="0" />
                    <WMENC_LONG Name="LogoLeft" Value="0" />
                    <WMENC_LONG Name="LogoColorKey" Value="0" />
                    <WMENC_BOOL Name="LogoEnabled" Value="yes" />
                    <WMENC_BOOL Name="UseRecordQueue" Value="no" />
                    <WMENC_STRING Name="RecordTempPath"
                    Value="C:\DOCUME~1\caesar\LOCALS~1\Temp\" />
                    <WMENC_STRING Name="MinimumDiskSpace" Value="10485760" />
                    <WMENC_BOOL Name="SaveToDiskOnlyDuringCapture" Value="no" />
                </UserData>

            </Source>
```

```
            <Source Type="WMENC_AUDIO"
                Scheme="device"
                InputSource="Osprey-200/300 Audio" >
                <UserData >
                    <WMENC_BOOL Name="UseRecordQueue" Value="no" />
                    <WMENC_STRING Name="RecordTempPath"
                    Value="C:\DOCUME~1\caesar\LOCALS~1\Temp\" />
                    <WMENC_STRING Name="MinimumDiskSpace" Value="10485760" />
                    <WMENC_BOOL Name="SaveToDiskOnlyDuringCapture" Value="no" />
                </UserData>

            </Source>

            <EncoderProfile id="Multiple bit rates audio (CBR) / Multiple bit rates video (CBR)" />
            <UserData >
            </UserData>

        </SourceGroup>

    </SourceGroups>

    <Broadcast Http="8080" />
    <WMEncoder_Profile id="Multiple bit rates audio (CBR) / Multiple bit rates video (CBR)" >
    <![CDATA[       <profile version="589824"
                storageformat="1"
                name="Multiple bit rates audio (CBR) / Multiple bit rates video (CBR)"
                description="">
                    <streamconfig majortype="{73647561-0000-0010-8000-00AA00389B71}"
                    streamnumber="1"
                    streamname="Audio Stream"
                    inputname="Audio409"
                    bitrate="32000"
                    bufferwindow="5000"
                    reliabletransport="0"
                    decodercomplexity=""
                    rfc1766langid="en-us"
>
                <wmmediatype subtype="{00000161-0000-0010-8000-00AA00389B71}"
                        bfixedsizesamples="1"
                        btemporalcompression="0"
                        lsamplesize="768">
                <waveformatex wFormatTag="353"
                            nChannels="2"
                            nSamplesPerSec="32000"
                            nAvgBytesPerSec="4000"
                            nBlockAlign="768"
                            wBitsPerSample="16"
                            codecdata="008800001700001E0000"/>
        </wmmediatype>
        </streamconfig>
                <streamconfig majortype="{73646976-0000-0010-8000-00AA00389B71}"
                streamnumber="2"
                streamname="Video Stream"
                inputname="Video409"
```

```
                    bitrate="241000"
                    bufferwindow="5000"
                    reliabletransport="0"
                    decodercomplexity="AU"
                    rfc1766langid="en-us"
>
                        <videomediaprops maxkeyframespacing="80000000"
                                quality="60"/>
            <wmmediatype subtype="{33564D57-0000-0010-8000-00AA00389B71}"
                    bfixedsizesamples="0"
                    btemporalcompression="1"
                    lsamplesize="0">
        <videoinfoheader dwbitrate="241000"
                        dwbiterrorrate="0"
                        avgtimeperframe="333667">
            <rcsource left="0"
                    top="0"
                    right="320"
                    bottom="240"/>
            <rctarget left="0"
                    top="0"
                    right="320"
                    bottom="240"/>
                <bitmapinfoheader biwidth="320"
                                biheight="240"
                                biplanes="1"
                                bibitcount="24"
                                bicompression="WMV3"
                                bisizeimage="0"
                                bixpelspermeter="0"
                                biypelspermeter="0"
                                biclrused="0"
                                biclrimportant="0"/>
            </videoinfoheader>
                </wmmediatype>
                </streamconfig>
        </profile>
        ]]>
        </WMEncoder_Profile>

        <UserData >
            <WMENC_LONG Name="Encoding\Dest" Value="2" />
            <WMENC_STRING Name="Encoding\Audio0" Value="{41DB0988-374A-4CB6-8929-
            44BAEA325D03}" />
            <WMENC_STRING Name="Encoding\Video0" Value="{BB8FC6CB-4E56-474A-BC95-
            16DD3072AF1A}" />
        </UserData>

</WMEncoder>
```


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